IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPLICANTS:	Choo et al.	EXAMINER: Tentoni, Leo B.
SERIAL NO.:	10/667,515	GROUP ART UNIT: 1732
FILED:	September 23, 2003	DOCKET: 6192.0261.D1 (8054L-206T)
FOR:	**METHOD AND APPARATUS FOR CUTTING A NON-METALLIC SUBSTRATE USING A LASER BEAM**	

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

In response to the Final Office Action dated November 23, 2005, finally rejecting Claim 8 under 35 U.S.C. §102(b) and 35 U.S.C. 103(a), and the Notice of Panel Decision from Pre-Appeal Brief Review dated March 30, 2006, Applicants appeal pursuant to the Notice of Appeal filed on February 23, 2006 and submit this Appeal Brief.

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, postpaid in an envelope, addressed to the: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on May 1, 2006.

Dated: May 1, 2006

Melinza Rodriguez

TABLE OF CONTENTS

1. Real Party in Interest

The real party in interest is Samsung Electronics Company, Limited, the assignee of the entire right, title, and interest in and to the subject application by virtue of an assignment of record.

2. Related Appeals and Interferences

None.

3. Status of Claims

Claims 8-13 are pending, stand rejected, and are under appeal.

Claims 1-7 have been cancelled.

A copy of the pending Claims is presented in the Appendix.

4. Status of Amendments

Claims 1-7 were cancelled and Claim 8 was amended by the Response to Notice of Non-Compliant Amendment filed October 5, 2005 and the corresponding Amended under 37 C.F.R. §1.111 filed September 7, 2005. This Amendment was entered.

5. Summary of Claimed Subject Matter

The present invention relates to an apparatus for cutting a non-metallic substrate.

Referring particularly to Claim 8 and Figure 2, an apparatus for cutting a non-metallic substrate (100) comprises a first laser beam generating means (110) that generates a first laser beam (120) for breaking molecular bonds of the non-metallic substrate material so as to heat a cutting path (150) formed on the non-metallic substrate and to form a scribe line (160) having a crack to a desired depth, and a second laser beam generating means (130) that generates a second laser beam (140) for propagating the crack along a scanning path of the first laser beam (120) in a depth direction of the substrate (see for example, page 11, lines 10-14), wherein the apparatus cuts the non-metallic substrate without a cooling device (see for example, page 20, lines 4-7).

6. Grounds of Rejection to be Reviewed on Appeal

A. Rejections Under 35 U.S.C. 102

i. Claim 8 stands rejected under 35 U.S.C. 102(b) as being anticipated by Chuo (USPN 3,930,825).

B. Rejections Under 35 U.S.C. 102

i. Claims 8 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Xuan (USPN 6,744,009).

ii. Claim 8 stands rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admissions.

C. Non-Statutory Obvious-Type Double Patenting

i. Claims 8, 12, and 13 stand rejected on the grounds of nonstatutory obvious-type double patenting as being unpatentable over Claims 11 and 13 of Nam et al. (USPN 6,541,730) in view of Stevens (USPN 5,622,540).

7. Argument

A. The Claim Rejections Under 35 U.S.C. 102 Are Legally Deficient

Under 35 U.S.C. §102, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the claim. See MPEP §2131.

i. Claim 8 In View Of Chuo

It is respectfully submitted that at the very least, Chuo is legally deficient to establish a case of anticipation against independent Claim 8.

Claim 8 claims, "a first laser beam generating means that generates a first laser beam for breaking molecular bonds of the non-metallic substrate material so as to heat a cutting path formed on the non-metallic substrate and to form a scribe line having a crack to a desired depth; and a second laser beam generating means that generates a second laser beam for propagating the crack along a scanning path of the first laser beam in a depth direction of the substrate, wherein the apparatus cuts the non-metallic substrate without a cooling device."

Chui teaches a method of producing an article of glass by cutting using a pair of focused laser beams which cut patterns in the glass having a common starting and ending point (see Abstract). Chui does not teach "a second laser beam generating means that generates a second laser beam for propagating the crack along a scanning path of the first laser beam in a depth direction of the substrate" as claimed in Claim 8. The pair of laser beams travel in separate paths to cut a pattern in the glass by cutting it out of a sheet of glass, for example, cutting two opposite 180 degree arcs to create a circle pattern (for example, see Figure 3 illustrating the two different

paths of a pair of lasers). Chui teaches that each laser of the pair of lasers takes a separate path. Further, it is clear that either of the pair of lasers of Chui is sufficient to cut through the glass substrate – as this is an object of the Chui invention – therefore, even where the first and second lasers have a common point along their separate paths (e.g., the starting point), the first laser cuts completely through the glass and does not form a "scribe line having a crack" as claimed in Claim 8. Therefore, Chui fails to teach "a second laser beam generating means that generates a second laser beam for propagating the crack along a scanning path of the first laser beam in a depth direction of the substrate" as claimed in Claim 8. Therefore, Chui fails to teach, either expressly or inherently, all the limitations of Claim 8.

B. The Claim Rejections Under 35 U.S.C. 103 Are Legally Deficient

In rejecting claims under 35 U.S.C. §103, the Examiner bears the initial burden of presenting a *prima facie* case of obviousness. In re Rijckaert, 9 F.3d 1531, 1532 (Fed. Cir. 1993). The burden of presenting a *prima facie* case of obviousness is only satisfied by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. In re Fine, 837 F.2d 1071, 1074 (Fed. Cir. 1988). A *prima facie* case of obviousness is established when the teachings of the prior art itself would appear to have suggested the claimed subject matter to one of ordinary skill in the art. In re Bell, 991 F.2d 781, 782 (Fed. Cir. 1993). If the Examiner fails to establish a *prima facie* case, the rejection is improper and must be overturned. In re Rijckaert, 9 F.3d at 1532 (citing In re Fine, 837 F.2d at 1074).

i. Claim 8 In View Of Xuan

It is respectfully submitted that at the very least, the teachings of Xuan are legally deficient to establish a *prima facie* case of obviousness against independent Claim 8.

Claim 8 claims, *inter alia*, "wherein the apparatus cuts the non-metallic substrate without a cooling device."

Xuan is inapplicable as 102(e) prior art in view of the certified English translation submitted on April 5, 2006 of the Korean Application 2001-27677, filed May 21, 2001, from which the present application claims priority. The 102(e) date of the Xuan reference is April 2, 2002. The Effective Filing Date of the present application is the priority date of May 21, 2001, which antedates the 102(e) date of Xuan. Therefore, Xuan is inapplicable as 102(e) prior art. Thus, Xuan's teachings cannot support a prima facie case of obviousness.

Further, Xuan teaches a system using a combined heating/cooling technique to scribe a substrate (see col. 3, lines 5-12 and col. 10, lines 55-59). Xuan does not teach or suggest cutting a non-metallic substrate without a cooling device, essentially as claimed in Claim 8. It is clear that Xuan's system uses a coolant source in scribing the substrate (see col. 8, lines 47-51). Nowhere does Xuan teach or suggest a system that may form a scribing line without such a coolant source. Therefore, Xuan fails to teach or suggest all the limitations of Claim 8.

ii. Claim 8 In View Of Applicant's Admissions

It is respectfully submitted that at the very least, the applicant's admissions are legally deficient to establish a *prima facie* case of obviousness against independent Claim 8.

Claim 8 claims "a first laser beam generating means that generates a first laser beam for

breaking molecular bonds of the non-metallic substrate material so as to heat a cutting path formed on the non-metallic substrate and to form a scribe line having a crack to a desired depth."

Applicant's admissions teach "a cooling fluid beam 14 having a markedly lower temperature than the heating temperature of the glass motherboard 10 is applied onto the rapidly heated cutting path 12. Accordingly, while the glass motherboard 10 is rapidly cooled, a crack is generated on a surface of the motherboard 10 to a desired depth to generate a scribe line 15" (see page 5, lines 1-18).

Applicant's admissions do not teach or suggest "a first laser beam generating means that generates a first laser beam for breaking molecular bonds of the non-metallic substrate material so as to heat a cutting path formed on the non-metallic substrate and to form a scribe line having a crack to a desired depth" as claimed in Claim 8. Applicant's admissions teach a cooling fluid generates a crack on a surface of the motherboard (see page 5, lines 7-8). Nowhere does applicant's admissions teach or suggest a laser for generating a scribe line having a crack, essentially as claimed in Claim 8, much less cutting a non-metallic substrate without a cooling device. Therefore, applicant's admissions fail to teach or suggest all the limitations of Claim 8.

C. Non-Statutory Obvious-Type Double Patenting

i. Claims 8, 12, and 13 In View Of Claims 11 and 13 of Nam et al. (USPN 6,541,730) in view of Stevens (USPN 5,622,540)

Applicants submit herewith a terminal disclaimer signed by an attorney of record, overcoming the rejection based on non-statutory obvious-type double patenting.

D. CONCLUSION

The limitations of independent Claim 8 are not disclosed by Chui. The limitations of independent Claim 8 are not taught or suggested by Xuan or applicant's admissions. Claims 9-13 depend from Claim 8. The dependent claims are believed to be allowable for at least the reasons given for Claim 8. The terminal disclaimer is believed to overcome the non-statutory double patenting rejection.

Accordingly, it is respectfully requested that the Board overrule the rejections of Claims 8-13.

Date: May 1, 2006

By: _____
Nathaniel T. Wallace
Reg. No. 48,909
Attorney for Appellants

F. CHAU & ASSOCIATES, LLP
130 Woodbury Road
Woodbury, New York 11797
TEL: (516) 692-8888
FAX: (516) 692-8889

8. CLAIMS APPENDIX

What is claimed is:

8. An apparatus for cutting a non-metallic substrate, comprising:

a first laser beam generating means that generates a first laser beam for breaking molecular bonds of the non-metallic substrate material so as to heat a cutting path formed on the non-metallic substrate and to form a scribe line having a crack to a desired depth; and

a second laser beam generating means that generates a second laser beam for propagating the crack along a scanning path of the first laser beam in a depth direction of the substrate,

wherein the apparatus cuts the non-metallic substrate without a cooling device.

9. The apparatus of claim 8, wherein the first laser beam has a wavelength having an absorptivity of 90% or more with respect to the non-metallic substrate.

10. The apparatus of claim 9, wherein the first laser beam is a 4.sup.th harmonics YAG laser beam having a wavelength of 266 nm.

11. The apparatus of claim 8, wherein the second laser beam is a CO_2 laser beam.

12. The apparatus of claim 8, wherein the first laser beam has a width less than that of the second laser beam.

13. The apparatus of claim 8, wherein the second laser beam is directly scanned onto the scribe line.